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Devices for advanced physics research

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ABSTRACT: *Present of the torsion pendulum of Cavendish (CTB) and the radiometer on heat fluxes (RHF). First instrument is the best for fundamental science for example new discovery affect ANRI and expect - AGRI ; second – intend to applied research at first time thermo nuclear fields at natural conditions .*

KEYWORDS: *torsion pendulum of Cavendish, solar neutrino stream, cross section, anomaly neutrino radio isotope (ANRI) absorption.*

I. INSTRUMENT FOR NEUTRINO SEARCH

Before using comparative analysis of the torsion balance and the CERN collider are as instruments for staging of crucial experiments for fundamental physics. On the balance made of an experiment to determine the cross-sections capture for the case where the flow of the solar neutrino interacts with a one radioactive mass of the dumbbell. The obtained estimates many orders of magnitude superior to the conventional meaning, also confirmed the existence of Mikheyev –Smirnov–Wolfenstein effect. There are proposed to the scientific community to dramatically reduce the cost of expensive but futile projects like the collider, or tokomak [1].
The results which were received based on using Cavendish's torsion balance, fig.1.

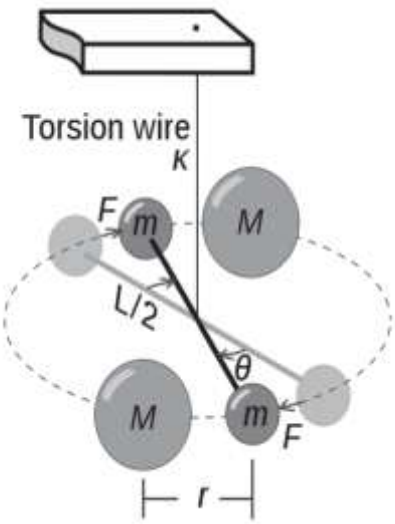

Figure 1: Schematic Picture of Cavendish Torsion Balance [2].

The research was made accordance to [3]. To present time there is researched neutrino in differences forms: solar neutrino stream, laboratory experiments, anti neutrino from nuclear reactor [4-9]. For every case always, scientist faced with the new discovery affect: anomalies neutrino radio isotope (ANRI) absorption that is big increase cross section, so from 10^{-42} to 10^{-12}. Simultaneously may be able expect: neutrino and graviton has few common property- cross sections, the similarity condition of creation that is the excision of anomalies graviton radio isotope (AGRI) absorption. For that most of the known experiments on the search and registration of cosmic neutrinos and gravitons are considered in details. The problems that previously prevented the recognition of successful experiments on the registration of gravitons (not enveloping gravitational waves) are indicated. The similarities and differences of the graviton and neutrino are mentioned, which contribute to the convergence of the methods of their registration. The decisive role in the interaction of these particles with the radioactive substance, that is, the ANRI and AGRI effects, is considered. More over a simple and affordable instrument for recording gravitons and neutrinos under conditions of their various manifestations on test bodies was developed (fig. 2).

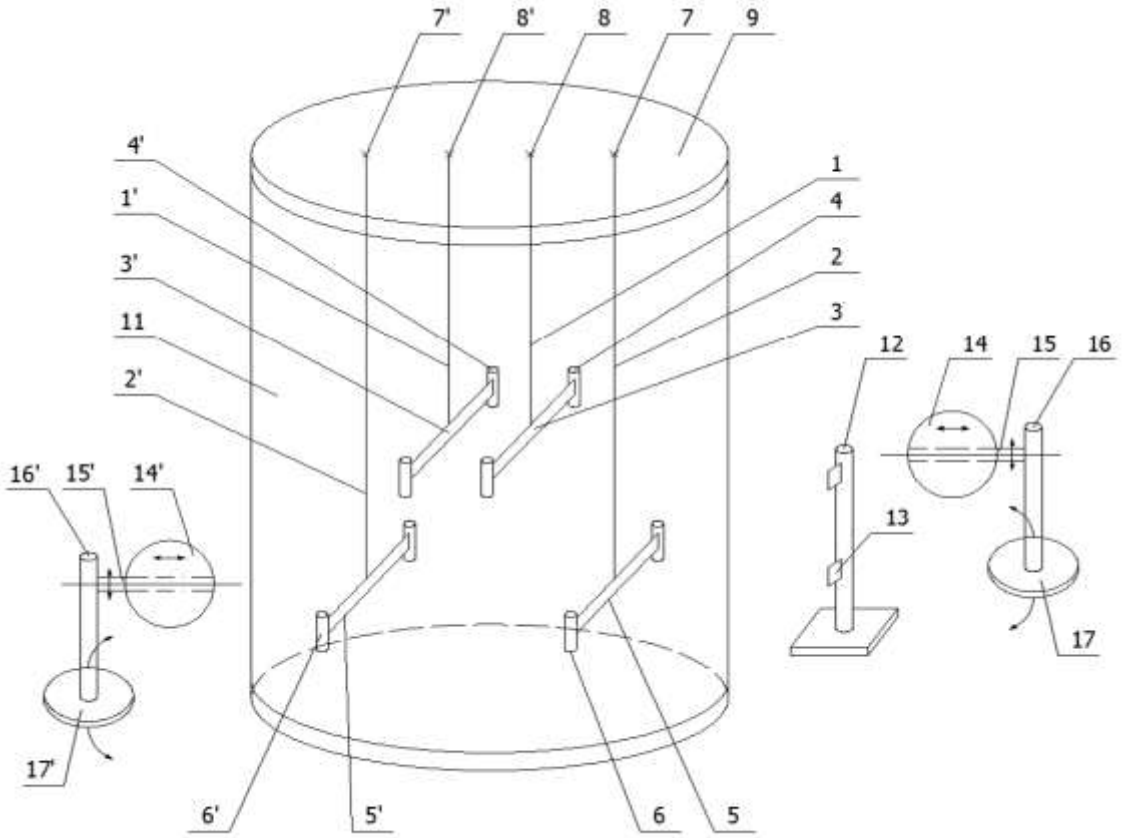

Figure2. Schematic diagram of the modified scheme for recording the field and corpuscular effects on test masses based on the torsion pendulum of Cavendish (CTB):

strands of suspensions of a pair of short-period pendulums; 2, 2 '- strands of suspensions of a pair of long-period pendulums; 3, 3 '- dumbbells (rocker arms) of short-period pendulums; 4, 4 'of the rocker arms 3, 3'; 5, 5 '- dumbbells (rocker arms) of long-period pendulums; 6, 6 '- removable test masses of long-period pendulums; 7, 7 '- points of fixing of threads of long-period pendulums; 8, 8 '- suspension points of short-period pendulums; 9 – top cover of the pendulum system; 10 – the basis of the system; 11 – the transparent case; 12 – the block of registration of turn of rocker arms 3, 3 'and 5, 5'; 13 – optical system for recording the rotation of rocker arms; 14, 14 '- calibration masses; 15, 15 '- rods for moving masses 14, 14'; 16,16 '- vertical racks for moving calibration masses; 17, 17 '- bases of trial masses for their rotational movement around pendulums. Arrows indicate the directions of displacement of the corresponding blocks.

Diagram of dumbbells in Fig.2

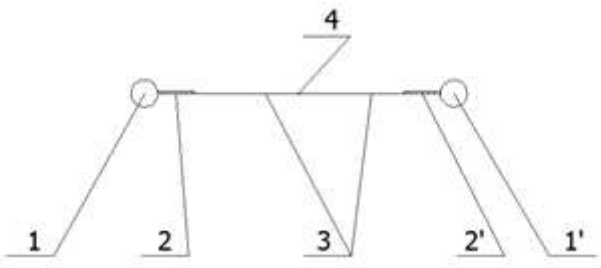

Fig.3 – top view, 1, 1 '-shaped rocker masses; 2, 2 `translucent sections of mirrors of rocker arms 3, 3 ', 5, 5' (see Figure 2); 3 – mirror-rocker; 4 – fixing point of the thread 5. Changing the masses of 1, 1 'to different radioisotopes or to a non-radioactive substance, it is possible to record the angle of rotation of the dumbbell (rocker arm) as a function of the direction and type of particles (graviton, neutrino).

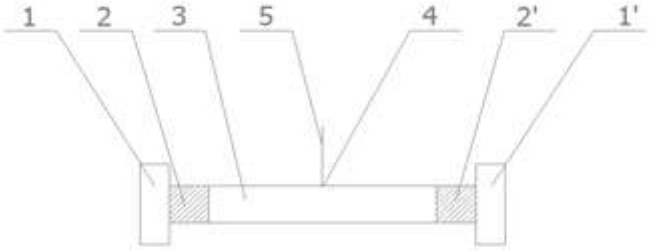

Fig. 4 – side view; 1, 1'- exchangeable rocker masses; 2, 2' – semitransparent sections of mirrors of rocker arms 3, 3 ', 5, 5' (see Figure 2); 3 – mirror – rocker; 4 – fixing point of the thread 5.

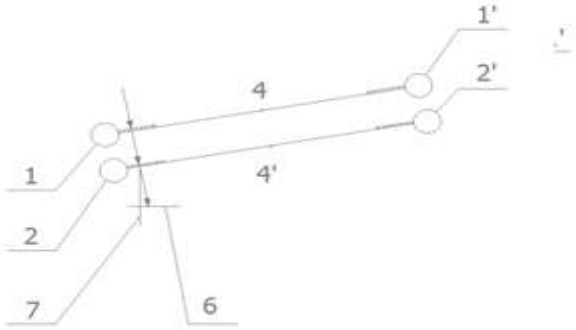

Fig.5. The synchronous rotation of the rocker arms occurs under the action of a neutrino signal, since the masses 1, 2 'consist of radioisotopes. Mirror-mirrors are parallel; the optical registration beam 6 does not fix the violation of parallelism of the mirrors, only their total rotation angle is recorded, on the registration surface 6 with respect to the vertical 7.

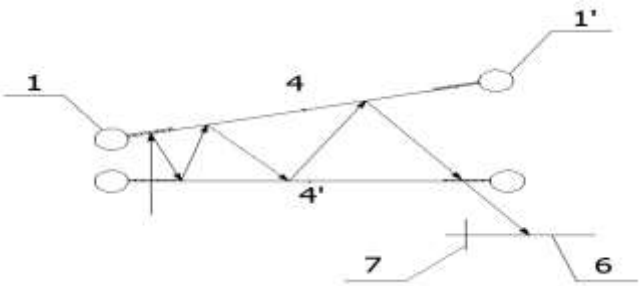

Fig.6. Violation of the parallelism of beam-mirror mirrors under the action of a graviton flow on a mass of 1.1. The beam 6 propagates between the mirrors, reinforcing the registration angle of the relative rotation of the mirrors 4, 4 'with respect to each other and the vertical 7.

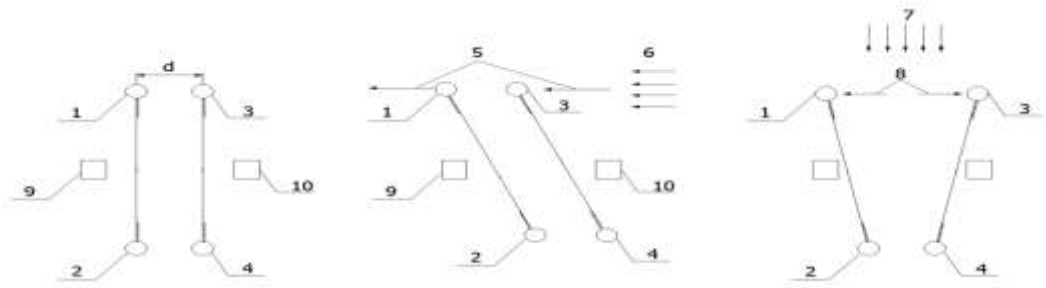

Fig.7. Scheme of displacements and rotation of rocker arms with loads 1-4 and registration systems 9,10: 1-cargoes from passive matter; 2-mass 1,3 from radioisotopes under the influence of a neutrino flux of 6, 3- mass under the action of a graviton flow 7.

The displacement scheme may demonstrate the existence of the ANRI and AGRI effects. In accordance of our research various schemes for the experimental recording and recording of the effects of graviton and neutrino fluxes on geophysical structures containing radioactive isotopes are presented and implemented. Some of the schemes were successfully implemented more than 40 years ago, when the existence of the ANRI and AGRI effects was unknown, which caused the non-recognition of the results of the experiments. The discovery of the ANRI and AGRI effects makes it possible to register astrophysical fluxes of gravitons and neutrinos, and the existence of gravitational waves – only as envelopes of the flow of gravitons (in the near future it is impossible). There is a simple and accessible scheme for registering fluxes of gravitons and neutrinos based on the torsion pendulum of Cavendish (fig.2-7).

II. INSTRUMENT FOR REPLACEMENT OF RADIOMETRIC METHOD

As is known the spectrum of temporal variations in the activity of a sample of the radioactive ore contains peaks that coincide with periods of the Sun's own oscillations [4-9]. The heavy radioactive deformed nucleus at the pre-decay moment increases by many orders of magnitude and is able to interact with the flux of solar neutrinos, which are modulated by the Sun's own oscillations. Further studies have identified the findings of this research as anomalous neutrino radioisotope (ANRI) absorption. To study these effects, as well as a wider application of the radiometric method, one can use the measurement of the heat fluxes of radioactive elements and their compounds as sources of radiation. That is, it is possible to implement a radiometer on heat fluxes, which will give identical information about the temporal variations of the activity of the sources [10].On the basis of a multilateral study, it was shown that the heat fluxes of radioactive elements and their compounds as radiation sources, as well as the radiometer, give identical information on the temporal variations of the activity of the sources. A radiometer based on recording the heat fluxes of radioactive sources has a characteristic that largely coincides with the data of standard radiometers based on a Geiger counter or a semiconductor receiver. It is also effective in the study of the ANRI effect. Radiometer for heat flows (RHF)structurally simple, compact, reliable; modifications of the RTP can be widely used in nuclear research and systems, in monitoring the state of nuclear burial sites, in space and in studying astrophysical processes. To the general set of types of radiometers, one should add the RHF and the method of indirect detection of the neutrino flux by the appearance of the spectral line of isotopes formed in the radioactive material of the antenna of new isotopes under the influence of neutrinos. When carrying out long-term studies it is necessary to know the existing neutrino background. RHF is most simply and reliably protected from external background influences. As shown by the studies (see above) The RHF circuit is operable and the device is its basis meets the requirements of known types radiometers and will probably continue to be productive use of the principle of calorimeters (fig.8) [11].

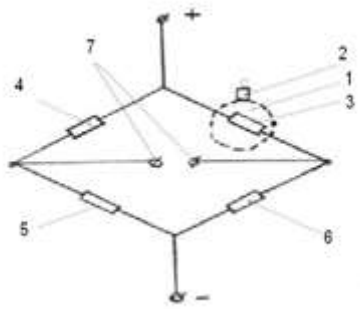

Fig.8. Principal (bridge) scheme of the radiometer

on heat fluxes (RHF): 1 – radioisotope
weight; 2 – classical radiometer; 3 – calibrated
thermoresistant; 4 … 6 – calibrated for
to the thermostor 3 resistors; 7 – conclusion of a useful

signal.

III. CONCLUSION

Analyzing of the torsion pendulum of Cavendish (CTB) and the radiometer on heat fluxes (RHF) shows: first instrument is the best for fundamental science; second – intend to applied research.

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